

BRANCH: STATISTICS
PAPER-ST-101: PROBABILITY AND DISTRIBUTIONS
FIRST SEMESTER

Max. Marks: 30

SECTION-A

Write any Five questions. Each question carries Four marks.

(5×4=20)

1. Define a field and a minimal o-field with examples.
2. Explain the axiomatic definition of probability.
3. Explain the distribution function and its properties.
4. Define mathematical expectation and conditional expectation.
5. State the Weak Law of Large Numbers.
6. State Kolmogorov's Strong law of Large Numbers.
7. Define the Compound Binomial distribution and obtain its mean.
8. Define Laplace and Logistic distributions.
9. Explain the distribution of a single order statistic.
10. Define convergence in probability and convergence almost surely.

SECTION-B

Answer Two of the following questions. All questions carry equal marks. (5×2=10)

- a) Explain classes of sets, fields, minimal o-fields and sequence of sets.
- b) State and prove the continuity theorem of probability.

**BRANCH: STATISTICS
PAPER-ST-102: ALGEBRA
FIRST SEMESTER**

Max. Marks: 30

PART-A

Write any Five questions. Each question carries Four marks.

(5×4=20)

1. Define a group homomorphism with an example.
2. State Cayley's theorem.
3. Define an ideal of a ring.
4. What is an integral domain?
5. Explain algebraic and transcendental elements.
6. What is the root of a polynomial?
7. Explain complemented lattices.
8. Define Boolean algebra.
9. Define a field extension.
10. Explain the counting principle used in group theory.

PART-B

Answer Two of the following questions. All questions carry equal marks.

(5×2=10)

- a) State and prove Sylow's First Theorem.
- b) Discuss the structure theorem for finite abelian groups.

BRANCH: STATISTICS
PAPER:ST-103: SAMPLING TECHNIQUES
FIRST SEMESTER

Max. Marks: 30

PART-A
(Short questions)

Write any Five questions. Each question carries 4 marks.

(5×4=20)

1. Explain Systematic Sampling.
2. Write down methods of populations with linear trend.
3. Discuss Varying Probability Sampling.
4. Define Cluster Sampling and write down its uses.
5. Explain Des Raj estimators.
6. Explain Two-Stage Sampling.
7. Discuss Double Sampling for Stratification.
8. Write down a mathematical model for errors of measurement.
9. Write down what are the sources of non-sampling errors.
10. Define Ratio estimator and Regression estimator.

PART-B

Answer Two of the following questions. All questions carry equal marks.

(5×2=10)

- a) Discuss allocation problem in stratified sampling.
- b) Explain Modified and balanced systematic sampling.

BRANCH: STATISTICS
PAPER:ST-104: COMPUTER PROGRAMMING
FIRST SEMESTER

Max. Marks: 30

PART-A

(Short Questions)

Write any Five questions. Each question carries 4 marks.

(5×4=20)

1. Explain Object oriented thinking and Java Basics.
2. Discuss about Data types.
3. Explain Inheritance.
4. Explain CLASSPATH.
5. Discuss concepts of exception handling.
6. Discuss termination models.
7. Explain Event handling.
8. Write down layout manager types.
9. Discuss concepts of Appletes.
10. Explain Swing.

PART - B

Answer Two of the following questions. All questions carry equal marks.

(5×2=10)

- a) Discuss History of Java, Java buzzwords and their importance.
- b) Explain Arrays with an example.

BRANCH: STATISTICS
PAPER: ST-105 : DISCRETE MATHEMATICS
FIRST SEMESTER

Max. Marks: 30

PART-A
(Short questions)

Write any Five questions. Each question carries Four marks.

(5 X 4 = 20)

1. State and explain De Morgan's laws.
2. Explain logical connectives with suitable examples.
3. Explain union, intersection and complement of sets.
4. Define function and classify different types of functions.
5. Define Boolean algebra and mention its basic properties.
6. Explain semigroup and monoid.
7. Explain binomial coefficient.
8. Define permutation and combination with examples.

PART-B

Answer Two of the following questions. All questions carry equal marks.

(5×2=10)

- a) Discuss the theory of inference for statement calculus with examples.
- b) Describe inference theory of predicate calculus and solve suitable examples.